HETHCOAT DAVIS

August 1, 2016

File: 1069-16/17

Mr. Phil Simmons
Tennessee Department of Environment and Conservation
Division of Water Resources
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, TN 37243

WPN16-0638

Re: Adamsville – WWTP Aeration and Sludge Removal
Funding through CDBG

Dear Mr. Simmons:

Please find attached four (4) sets of plans and specifications for the referenced project for your review and approval. This project includes the installation of aerators in both treatment lagoons and the removal of sludge from Lagoon No. 1, and all other work necessary to complete the project. The Contractor will be responsible for all sludge testing and permitting for disposal in accordance with TDEC Chapter 0400-40-15 "Biosolids Management". The project components are considered "Modifications to a Sewer Treatment Facility w/design flow ≥0.075 MGD but <1 MGD". A check for the review application fee in the amount of $100 is attached. The Adamsville WWTP operates and discharges under NPDES Permit No. TN0064785.

Please note that for the duration between the start-up of the aerators and the completion of the sludge removal, Lagoon No. 1 will be taken out of service. All of the influent flow will be bypass pumped directly into Lagoon No. 2, and the pipe between the two lagoons will be temporarily plugged. Bypass pumping will be required so that the disturbed sludge does not enter Lagoon No. 2. We respectfully request a temporary a variance in treatment operations after the aerators are placed in service and the sludge removal process in underway. Calculations are provided that indicate a 87 day detention time exists in the second lagoon at the NPDES permitted flow. 160 Hp within the lagoon equates to 6.1 Hp/ MG which places the lagoon in the partial mix classification. Using Se=30 mg/l and So=200 mg/l the detention time needs to be at least 20.5 days. The temporary operation should be able to provide the necessary treatment until the plant is able to resume normal operations.

If you have any questions or require any additional information please do not hesitate to contact me.

Sincerely,

Stacey Cox

Stacey Cox, PE

Cc: Paul Plunk, City of Adamsville

278 Franklin Road, Suite 200 | Brentwood, TN 37027 | Phone: 615.577.4300 | Fax: 615.577.4303

Adamsville WWTP
Lagoon #2 Treatment Calculations

no less than 7ft

Surface Area is 7.9 acres and depth is 12-feet
Top Dimensions = 1280' x 270' = 345,600 sf

Assume Sides of Lagoon #2 are 3:1

Bottom of lagoon dimensions = 1208' x 198' = 239,184 sf

Volume = L ((A1+A2)/2) = 12 ((345600+239184)/2) = 3,508,704 cf

1 cf = 7.48052 gallons

3,508,704 cf = 26.2 MG

Aeration in Lagoon 2 is 8 each at 20 Hp = 160 Hp
Aeration = 6.1 Hp/ MG, which is classified as a Partial Mix Lagoon (4 to 10 Hp/ MG)

Detention Time Required per TDEC Design Criteria

Se/So = 1/(1+2.3kt)

30/200 = 1(1+2.3*.12*t)

.15 = 1/(1+.276t)

.15 + .0414t = 1

.0414t = 0.85

t = 20.5 days

Detention Time Provided in Lagoon 2 at Design Rating (0.299 MGD)

Detention Time (t) = 26.2 MG/ 0.299 MGD

t = 87.6 days

★ upgrade existing lagoon - or does le
- Most are single cell lagoons built using 1960 criteria
- not less than 3 ponds should be used to provide the detention time & volume required.
- aeration equipment
  - MINIMUM of 2 aerators with at least 3 anchor points for each aerator
  - access to aerators for routine maintenance
  - # timers

Ch. 9
Aerated lagoons
- partially mixed
4-10 HP/MG